

Parts iii. and iv., which deal respectively with road making and bridges, form vol. ii.; here again the parts have been subdivided into sections. The various problems and practical operations are dealt with in a very explicit and satisfactory manner. In this volume, as well as in the others, many useful figures and illustrations are given which supplement and enhance the value of the text. Parts v. to viii. are included in the third and last volume of the manual. As the author points out, this volume deals with those subjects which are of special interest to the forest manager. In dealing with the transport of timber, the author has given a complete account of the different methods of transport by roads, slides, forest tramways, wire-rope ways, and water. Each method has its own particular advantage, according to circumstances, which vary from place to place, but, with this volume as a guide, the forester need have no difficulty in selecting the method best suited to his own local conditions.

As the title indicates, the manual is intended for the use of forest officers in India, to whom it cannot fail to be of the greatest service and value. Great care has been taken to make the work as accurate and up to date as possible, and with this end in view the author sent proofs of the different parts of the manual to the Inspector-General of Forests to the Government of India and all conservators of forests for circulation among such forest officers as they might select for the purpose of recording any suggestions which they had to make; hence before publication the book was subjected to a thorough, practical, and critical examination, which renders it a standard authority and trustworthy source of reference.

While not replacing any of the standard works on civil engineering, the manual fills a big gap in the literature, and it is written in such a way that even those who have not had a special training in engineering may understand and appreciate its use. This work merits, and will no doubt attain, a wide circulation outside India. As a work of reference it should be in the hands of all whose profession brings them in contact with such engineering operations as do not require the skill of a highly trained expert.

There is a marked absence of technical terms, and where the use of these is unavoidable the author takes good care to make their meaning thoroughly clear. The illustrations form a very valuable feature of the manual, and greatly increase its practical utility. In most cases a detailed description has been appended, so that each figure may be clearly understood without any further reference to the text. The majority of these illustrations were drawn specially for the manual, a fact which adds much to their value. For the few illustrations which have been borrowed from other sources ample acknowledgment is made.

It will thus be seen that the manual embraces a wide range of subjects, all of which are pretty intimately associated with forestry. The third volume is of special interest to the forest manager, while vols. i. and ii. cannot fail to be also of great utility and value to those concerned in agriculture, horticulture, and planting in all their branches.

It has been the endeavour of the author, as he in-

forms us in the preface, to make the manual a book of reference for the practical man as well as a textbook for the use of students. With this end in view, the information given on each subject has been made as complete and compact in itself as possible, thus obviating the necessity of cross references. In adapting the work to serve this double purpose, the author has exhibited a great amount of skill in the selection, treatment, and arrangement of the information given under the various headings.

NATURAL HISTORY OF COMMON ANIMALS.

The Natural History of Some Common Animals. (Cambridge Biological Series.) By Oswald H. Latter. Pp. x + 331. (Cambridge: University Press.) Price 5s. net.

THIS is an excellent book, written by a man who is equally in his element whether he writes as an outdoor naturalist or as a laboratory student. This combination is by no means a common one, and it is just the combination that is wanted for a book of this kind.

The common animals chosen are earthworms and leeches, the crayfish, the cockroach and its allies, dragonflies, wasps, the fresh-water mussel, snails and slugs, frogs, toads and newts, and some common internal parasites of domestic animals. The treatment of the "earthworm" is first rate. Its structure is well described, and always as the structure of a live animal, the function of each part being never lost sight of. For instance, the use of the setæ in locomotion is made clear, and the simple experiment of putting the earthworm on a polished horizontal surface is suggested. The familiar phenomenon of earthworms appearing on the surface of the soil after heavy rain is explained, and, no less successfully, what is less familiar, their method of coping with bacteria.

The "crayfish" seems to be the least successful of the papers. Only twenty-two pages are allowed to it, and of these five and a half are devoted to a discussion of the function of the otocysts. There is no lack of interest in the five and a half pages, but much that has been omitted might have claimed precedence. There is little about the appendages, from the swimmerets to the eye-stalks—a field rich in interest to the evolutionist. When the work of the scaphognathite is described, a parenthetic explanation, not easy to understand without previous knowledge, of what the scaphognathite is has to be inserted.

With insects Mr. Latter is thoroughly at home. He has made a great many observations of his own, and he has read the literature of his subject, so that he is able to give the best of what has been discovered. The result of reading his account of the wasp and its mode of life is that one wishes to read more. He has much to say about its sting, its "homing" faculty, its parasites. He enters equally into the life of the fresh-water mussel and its young glochidia sticking to fish and trailing after them. In the maw of a fresh-water mussel were found, among other things, a number of rotifers, a very interesting fact, especially

to one who has long tried to discover what preys on these small succulent creatures. Those that are bigger of build prey upon the smaller, and a large infusorian will swallow a small rotifer, but the fresh-water mussel is a giant who devours great and small impartially.

The paper on snails and slugs is good throughout, and might with advantage have been extended beyond the thirty pages allotted to it. The want of space is due to the attempt to make the book useful to the systematist and the collector, as well as to the observer and student of the lives of animals. No less than eleven pages are devoted to the definitions of the different species of British land and fresh-water gastropods, and, after all, they are too brief to be of much use to the collector. Why, then, insert them at all? In the same way no less than eight pages are expended on the specific characters of dragonflies. Where, as in the case of the British Amphibia, there are but few species, the descriptions are fuller and well suited to what I take to be the aim and purpose of the book, viz. to help and encourage the genuine student and observer as distinguished from the mere collector. Altogether the book is an admirable one. Though the waste of space which has been pointed out is to be regretted, it does not interfere with the excellence of the rest. The illustrations, fifty-four in number, are good.

F. W. H.

OUR BOOK SHELF.

The Purification of Sewage. By S. Barwise, M.D., B.Sc. Pp. xiv+220. (London: Crosby Lockwood and Son, 1904.) Price 10s. 6d. net.

THE author has in the present edition attempted to bring the information available upon this important subject up to the present state of knowledge and practice, and he has added to the former edition an appendix in which the processes in common use for the chemical examination of sewage and sewage effluents are briefly described. The work bears evidence that it has been written by one who is in touch with the practical side of the recent methods of sewage purification; the text also indicates considerable acquaintance with the advances which have been made in the treatment of sewage in various centres of population in this country.

The matters dealt with briefly but usefully include:—the nature, varieties, and chemical nature of sewage; pollution of rivers by sewage; and the treatment of sewage by land, by precipitation, and by the "septic tank," followed by either the intermittent or the percolating bacteria bed. These processes are illustrated by good reproductions of photographs, and by sectional and diagrammatic drawings. The appendix on chemical processes of analysis is also illustrated, but the directions are such as can only be usefully followed by one who has received a training in chemical analysis.

The book will undoubtedly be of use to those who are responsible for directing and advising on the treatment of sewage. The information furnished, as a whole, is reasonably accurate and up-to-date, but there are portions of the book in which the author appears to show lack of information of published results. Thus his statement on p. 125 of the relative advantages of intermittent and percolating beds leaves out of consideration the very potent aëration of the intermittent bed by the process of gaseous diffusion, since results published by the London

County Council show that even at the bottom of a twelve-foot bed a fair proportion of oxygen was present in the interstitial air; he also appears to hold the opinion that such a bed has a serious tendency to become choked, which is not noticed in properly worked beds; and he speaks of four feet being "the maximum efficient depth" for such a bed, when he should know that a 12-foot bed has been worked with entirely satisfactory results. In these and in other respects the intermittent bed appears at an unfair disadvantage with the percolating bed. It should be understood that these two methods of subjecting sewage to aërobic purification are at present under trial, and as a verdict is still scarcely obtainable, a cautious statement of their relative merits is desirable.

Physiologie des Menschen. By Dr. Luigi Luciani. Ins Deutsche übertragen und bearbeitet. By Dr. Baglioni and Dr. Winterstein. Erste und zweite Lieferungen. Pp. vii+322. (Jena: Fischer, 1904.) Price 4 marks each.

THIS translation into German of Luciani's text-book of physiology aims at occupying an intermediate position between the student's text-book and the larger handbooks, being more complete than the former and less encyclopædic than the latter. The translators have brought the book up to date by additions summarising more recent work.

The present first two parts of the work, which is expected to extend to twelve parts, deal with general or cellular physiology, the physiology of the blood and circulation, and the physicochemical phenomena of respiration.

Very interesting and complete accounts are given of the mechanism of the heart beat, and of the physiology of the cardiac muscle and nerves, to our knowledge of which the author himself has added much. The detailed description of practical methods has been wisely printed in smaller type.

Useful summaries of the chief sources of the literature of physiology are given at the close of each section.

A special feature of the work lies in the excellence of the historical introductions to the sections dealt with. The account of the discovery of the circulation is exceptionally complete and interesting.

So far as one can judge from the two parts already published, the difficult task of the collection of facts and their fusion into an interesting whole has been carried out with admirable skill, and the text-book promises to form a most useful and philosophic presentation of the chief facts of physiology. The author and translators are to be congratulated on the production of a work which is distinguished not only by its mastery of detail, but by its eminently readable character and attractive literary form. The appearance of the later parts will be looked forward to with much interest.

Kritische Nachträge zur Flora der Nordwestdeutschen Tiefebene. By Dr. F. Buchenau. Pp. vi+74. (Leipzig: W. Engelmann, 1904.) Price 1s. 6d.

THE "Flora der Nordwestdeutschen Tiefebene" was published in 1894, and was well received. Since that time the author has personally, and with the help of other botanists, collected a number of new localities for plants enumerated in the flora, and new plants have been discovered. As the publishers could not at present undertake a second edition, Dr. Buchenau has prepared this small pamphlet, which forms an appendix. It contains a full numbered list of all the species of the area, but diagnostic characters are given only for new species or varieties, and the additions and eliminations are tabulated at the end of the book.